

EXPANDING SIMULATIONS AS A MEANS OF TACTICAL
TRAINING WITH MULTINATIONAL PARTNERS

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Joint Planning Studies

by

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ABSTRACT

EXPANDING SIMULATIONS AS A MEANS OF TACTICAL TRAINING WITH MULTINATIONAL PARTNERS, by Major Andrew S. Eagen, 75 pages.

As the problems the force is asked to solve change, the implied task associated is that ways and means of training change and evolve to meet those challenges. This thesis examined the possibility of linked simulation training from CONUS to OCONUS at the tactical echelon with multinational partners. Through comparative document analysis, the research focused on understanding the mission of regionally aligned forces, the simulation technology available, and the viewpoint of NATO and European Union partners on simulations training. Each category provided evidence to support the concept as acceptable and feasible between the parties investigated during this project. Analysis focused on identifying a capabilities gap through DOTMLPF in combination with an assessment of two case studies involving higher echelon use of simulations. Through this methodology, the findings are that D/O/P/F have required capabilities to support linked simulations training, but gaps in the areas of T/L/M exists preventing this training opportunity from occurring beyond the gaming environment.

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ACRONYMS

ABCT	Armored Brigade Combat Team
AOC	Army Operating Concept
CCTT	Close Combat Tactical Trainer
CONUS	Continental United States location
DOTMLPF	Doctrine, Organization, Training, Material, Leadership and Education, Personnel, Facilities
EU	European Union
EUCOM	European Command
GCC	Geographical Combatant Command
IA	Integrated Architecture
JMRC	Joint Multinational Readiness Center
L/V/C	Live, Virtual, Constructive simulation environment
LFX	Live Fire Exercise
LVC-IA	Live, Virtual, Constructive-Integrated Architecture
NATO	North Atlantic Treaty Organization
NMS	National Military Strategy
OCNUS	Outside the Continental United States
RAF	Regionally Aligned Forces
SRCA	Service Retained Combatant Command Aligned

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CHAPTER 1

INTRODUCTION

Initial interest in this study began through exposure to the process of the U.S. Army's transition from a guiding concept in AirLand Battle to the new Army Operating Concept. The 1982 change of FM 100-5, as explained by Douglass Skinner, had numerous layers and controversies.¹ A significant aspect of the transition to AirLand Battle for the Army was how the (then) current Army was not able to achieve the core principles of the concept when released in 1982.² Subsequent additions accompanied FM 100-5 (known as AirLand Battle) after its release in 1982, which would go into greater depth on areas such as technology and tactical procedures necessary for development to implement the new concept of warfighting.³ Over thirty years after that massive conceptual change, today's U.S. Army is again updating its theory towards warfighting. TRADOC released in 2010 The Army Operating Concept (AOC) and then an update to that pamphlet in 2014.⁴ Much as AirLand Battle challenged the current thinking of army leaders then, the AOC looks to change the thinking of today's leaders. In March of 2016, GEN Perkins of the U.S. Army, as Commanding General of TRADOC, outlined the way forward in Army innovation at the AUSA Global Force Symposium. In his comments,

¹ Douglas W. Skinner, Professional Paper 463, *Airland Battle Doctrine* (Alexandria, VA: Center for Naval Analyses, September 1988), 6.

² Ibid., 8.

³ Ibid., 3.

⁴ U.S. Army, TRADOC Pamphlet 525-3-1, *The Army Operating Concept. Win in a Complex World* (Fort Eustis, VA: Department of the Army, 2014), 2.

two significant concepts relate to the current position of the Army in development: Eight categories of focus that were not specific material solutions; and while the specific enemy is unknown but can be guaranteed they are innovating right now to defeat the U.S.

Army.⁵ The AOC shares another relationship of note with AirLand Battle in that specific (or tangible) developments followed the release of the concept. GEN Perkins and TRADOC are now getting specific with moving their vision to action through the Multi-Domain Battle methodology.⁶

In the spirit of this generation's evolution of warfighting methods and theories, the purpose of this study began as a means to generate options available to U.S. Army unit's training strategy. From the national level through the tactical level, the military is oriented towards a greater dependency on unified action and the Army policy reaction is Regionally Aligned Forces, therefore a logical research direction seemed to be to investigate how to make available the fully array of the Joint Force as a mechanism in training.⁷ The immediate issue encountered was whether the technology for the desired capability is available to both the U.S. Army and several of its multinational partners. Yet

⁵ Supunnee Ulibarri, "TRADOC's Perspectives on 'Big 8' Initiatives" (Lecture, Association of the United States Army's Global Force Symposium, Huntsville, AL, 17 March 2016, accessed 11 December 2016, https://www.army.mil/article/164728/_Big_8__initiative__Army_Operating_Concept_will_build_the_future_Army).

⁶ David G. Perkins, "Multi-Domain Battle: Joint Combined Arms Concept for the 21st Century," Association of the United States Army, 21 November 2016, 1, accessed 11 December 2016, <https://www.ausa.org/articles/multi-domain-battle-joint-combined-arms-concept-21st-century>.

⁷ Gregory L. Cantwell, Mark E. Orwat, and Tam D. Warren, *Regionally Aligned Forces: Concept Viability and Implementation*, ed. Larry D. Miller (Carlisle Barracks, PA: U.S. Army War College Press, 2015), 139.

another issue deserving consideration is which partners can incorporate this technology. Equally important is understanding, if these current technological partners are those that the U.S. Army is seeking an increased training capacity with in the future.

The evolution of the problem, as more understanding grew, shifted away from simply providing Joint Force effects to our partners to, instead, how to better prepare tactical units for the Army's anticipated missions. This study will examine a more precise capability and specific implementation of capabilities within the U.S. Department of Defense simulations realm. The research intends to provide a feasible recommendation to integrate U.S. Army unit home station training to multinational partners. That theory could possibly have applications across all levels of war, but the primary focus for both the research and recommendations is on the tactical level from platoon through battalion level. Next, the guiding research questions are presented to reveal the process and the necessary knowledge to answer the primary question.

Research Question

How can U.S. Army units conduct home station training at the tactical level that is linked to multinational partners in a realistic operational environment that enables mission readiness?

Secondary Questions

Several secondary questions arose in the process of answering the primary research question. Many investigated proved to not have as much value due to the limited impacts of the knowledge gained, and therefore eight secondary questions ultimately proved the most influential. The fundamental question to ask in seeking an answer for the

primary research was why would this type of training be of interest to the Army? Sharing a direct relationship with that of interest to the Army is how does this training affect Army organizations? Therefore, that issue is the next secondary question. Simulation capability served as an obvious area of exploration during research and a few questions drove that inquiry. About simulations, an essential requirement is to ask what are the existing capabilities within the simulations realm to support this concept? As the concept to link training through simulations is the task, another paramount question for the research became what constraints must be overcome to generate CONUS to OCONUS training in a simulations environment? A key aspect of the primary question is multinational partners and their interests and capabilities required examination too. With a focus on EUCOM during this project, understanding what drives NATO and EU priorities in defense/security/military development is a clear requirement. Just comprehending if NATO and the EU would support simulations training is not enough evidence and so another question remains: which partners within NATO and the EU is this concept a potentially acceptable and feasible way forward? These questions afford substantial evidence but do not complete the necessary requirements of a solution to the primary research question. The remaining questions of what are measures of acceptable and feasible in relation to this concept and are there similar training events being conducted in the Army created the necessary depth of research to offer legitimate recommendations and conclusions towards the primary research question.

Assumptions

A driving assumption of this project is that current national policy and associated nested documentation through the operational level describing potential ways and means of preparation remain valid into the future.

Beginning with key elements of the 2015 National Military Strategy (NMS) to how the Joint Force will react to the strategic environment, assumptions this project makes are:

The military environment “today and into the foreseeable future,” calls for a transition to focus on state actors as opposed to radical extremists as the primary military threat.⁸

“Strengthen our global network of allies and partners” remains a national military objective.⁹

The eight key components of globally integrated operations remain as the framework to preparing and orienting the military. From the NMS, these eight components are the following: “employing mission command; seizing, retaining, and exploiting the initiative; leveraging global agility; partnering; demonstrating flexibility in establishing joint forces; improving cross-domain synergy; using flexible, low-signature

⁸ Joint Chiefs of Staff, *The National Military Strategy of the United States of America: The United States Military’s Contribution to National Security* (Washington, DC: Department of Defense, 2015), 3.

⁹ Ibid., 5.

capabilities; and being increasingly discriminate to minimize unintended consequences.”¹⁰

This study also assumes that the AOC warfighting challenges and the fundamentals proposed by the AOC as necessary to decisive action training for the Army are valid.

Another is that the RAF concept continues to be a mechanism to drive unit training. RAF allocation of Army Brigade Combat Teams generates training requirements with specific allies and partners, which makes the concept under investigation here applicable to the whole force of the U.S. Army.

Further assumptions are necessary to generate recommendations. The first assumption is that NATO has the justification and authority to drive initiatives within our European allies. Another assumption is the EU’s influence is great enough on security initiative decisions to adopt new training methods among U.S. Army partners.

Lastly, for this project a valid and necessary assumption is that simulations remain as a doctrinally acceptable means of accomplishing readiness. Specific aspects of simulations, which are important, are the current capabilities available to both U.S. Army units and multinational armies, and the anticipated growth of capabilities that will be available for training. Assuming simulations remain as a training mechanism is crucial for both the research and recommendations.

¹⁰ Joint Chiefs of Staff, 10.

Limitations

The possibility that some simulation materials have a caveat or classification, which denies those materials from use started as a limitation. Throughout the duration of the research, literature and sources without restrictions on inclusion resolved this limitation without compromising the ability to answer all the research questions completely and in an unclassified manner.

Scope and Delimitations

The study assesses feasibility and suitability of the model for only the EUCOM theater due to time. Thus, a cascading effect of analyzing only EUCOM results in a primary focus on ABCT formations, as these are the Army units currently meeting the theater's requirements for RAF.¹¹ However, by focusing research on the ABCT formations, the study may still offer recommendations towards capability gaps associated with all types of the Army BCTs: Infantry, Stryker, or Armor.

Other GCCs were eliminated due to time constraints and depth of available literature; however, these areas are not disregarded in terms of recommendations for future study.

Due to time and experience limitations, a quantitative analysis did not occur. To mitigate this factor, the study does review sources to indicate where potential follow-up

¹¹ The formations that have deployed are 1/1 CD, 1/3 ID, and 3/4 ID, and all are ABCTs. This is open-source information and common knowledge to the researcher. Additionally, the EUCOM Commander has assigned an SBCT and IBCT; therefore, those formations would not fill the RAF mission. Global Response Force is a different mission and not included in RAF; and therefore is not accounted for in that manner here.

studies could focus quantitative analysis, such as the NATO Defense expenditures or the cost of technologies.

Significance of Study

The results of this study can apply current practices in the conduct of training at the strategic/operational level to a gap, which exists in the conduct of training at the tactical level to accomplish missions with multinational partners.

Potentially, outcomes may foster results or additional information to the Army warfighting challenges through DOTMLPF solutions. As a functional concept, Multi-Domain Battle is still in the early stages of development, recommendations will seek to link the application of the proposed use of simulations at the tactical level and the new concept.

Summary and Conclusions

The United States Army has shown a willingness and an ability to change its approach to waging war over the decades. Generally, new approaches represent a focus on the likely missions that the nation asks of the force. As the problems to solve change, the associated implied task for the ways and means of training change, and evolves to meet those challenges.

Today's force is experiencing one of the large-scale changes to the Army's approach to warfare. The focus here is to review current scientific approaches to training, and offer examples of artful applications and recommend further evolution of these examples to affect the whole force. In the next chapter, the literature review provides science-based resources available to Army formations, and outlines past and current

means for training. As the art of warfare and training is often a reflection of leadership responsible for those actions, the intent is not to definitively answer how organizations should train. However, the following chapter explores literature that justifies simulations training with multinational partners as an available and legitimate solution for the force.

CHAPTER 2

LITERATURE REVIEW

Introduction and Method of Review

Generating options for U.S. Army simulation training strategy, while benefitting the mission(s) for regionally aligned forces, has tremendous impacts. As unified action for tactical level Army organizations manifests through a policy of Regionally Aligned Forces, the ability to prepare for the challenges of the RAF mission set needs to involve as many mechanisms for training as possible.¹²

The research fit into two broad categories: the art of command and the science of control. ADRP 6-0 defines art of command as “the creative and skillful exercise of authority through timely decision making and leadership,” and control as “the science of control consists of systems and procedures used to improve the commander’s understanding and support accomplishing missions.”¹³ In chapter 2, sources that provide context towards available means of both command and control reveal the necessary data to investigate the linking of simulations for U.S. Army units HST with multinational partners. The chapter continues to a review of the literature that justifies simulations as a mechanism worth exploring for units to train, and then onto sources which validate that reasoning by a review of both U.S. policy and the priorities of the U.S. Army’s allies and partners.

¹² Cantwell, Orwat, and Warren, 140.

¹³ U.S. Army, Army Doctrine Reference Publication (ADRP) 6-0, *Mission Command* (Washington, DC: Department of the Army, 2012), 2-5, 2-13.

This chapter's review consists of four sections. The first section, Mission, reviews national policy, strategic and operational concepts, and tactical level training methodology. The second section, Simulations, covers past, present, and future capabilities. The third section, Cooperation, reviews NATO and EU security initiatives and policies. The final section, Potential Threats, presents concepts that frame the necessity for training in EUCOM, and offers insight on the value of simulations as a training resource for the current operational environment.

Mission

To justify the argument of training with multinational partners, policy at the national level receives attention first. The primary source for this level is the National Military Strategy (NMS), because its stated purpose is to describe how the armed forces contribute to National Security: "This National Military Strategy describes how we will employ our military forces to protect and advance our national interests."¹⁴ The NMS is broken into five areas: I-The Strategic Environment; II-The Military Environment; III-An Integrated Military Strategy; IV-Joint Force Initiatives; and V-Conclusion. Aspects of the strategy that validate the concept of multinational partner training, and why simulations would be a suitable mechanism of that training come from areas I, III, and IV.

Nested under the national level is the Army Operating Concept (AOC), the Army's strategic concept complementing the NMS. The AOC expands on the themes of the NMS for Army organizations. The AOC reemphasizes Russia as a competitor

¹⁴ Joint Chiefs of Staff, i.

towards U.S. national interests.¹⁵ Ultimately, the AOC discusses the future Army between 2020 and 2040.¹⁶

The NMS and AOC directly support multinational training, but neither has operationalized how to accomplish this training for Army units. The current concept that accomplishes this is Regionally Aligned Forces. Several published operations orders, execution orders, and Department of the Army briefings that officially capture the RAF concept exist, but retain a classification greater than “unclassified.” In the interest of keeping the research at the lowest level of classification and maximizing availability, these sources are not incorporated into the thesis. Before this determination on direction became final, many of these non-unclassified documents received thorough review, but acceptable unclassified pieces of consulted literature support the advancement of the thesis without restrictions and loss of valuable information. The source for understanding RAF falls into this category. The source is not an official Army document, but is instead a research thesis published by the United States Army War College in 2015, titled *Regionally Aligned Forces: Concept Viability and Implementation*. The evolution of RAF as a concept and how the Army implements the concept within the force is the notable features from this thesis. The thesis presents a comprehensive assessment of RAF across all Warfighting Functions, but the main points of value are from the portions that cover the development and implementation of the concept, and how RAF ultimately drives training to include multinational partners.

¹⁵ U.S. Army, TRADOC Pamphlet 525-3-1, 12.

¹⁶ Ibid., i.

The most current and definitive source for this study's examination of science for available training to units is the Army's doctrinal publication FM 7-0, *Train to Win in a Complex World*. Published in October of 2016, this manual updates AD RP 7-0 from 2012, and adds substance to the concepts behind training management. The doctrine is composed of three chapters: the first defines the Army's training concepts and how to sustain readiness over time; the second provides detailed explanation of processes used to train; and chapter 3 provides useful tools for organizations to formalization these concepts and processes into executable plans and orders.¹⁷ This manual serves as a primary source for accomplishing the necessary research and understanding the premise how simulations training through collaboration with multinational partners is justifiable within the doctrine of the U.S. Army. The next step is to investigate what technology is available to an Army unit's training.

Simulations

No literature specifically addresses simulations training with multinational partners. The available literature focuses on the usefulness of simulations in training, but only focuses on U.S. formations. Additionally, the timeliness of existing literature is an issue as most accounts for research done between 2002 and 2010. While not robust, the literature available does foster a sound foundation for generating understanding of simulations and the mechanics required to produce desired training outcomes.

¹⁷ U.S. Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Department of the Army, 2016), vii, accessed 10 February 2017, http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%207-0%20FINAL%20WEB.pdf.

The most representative piece, written by LTC David W. Riggins, is “The Direction of Virtual Vehicle Simulations for Military Training.”¹⁸ Written in 2006, some recommendations and constraints that he highlights, have been accounted for in today’s environment. However, his thesis, like this study, advocates increasing the connectivity of both systems and environments to increase training value.¹⁹ LTC Riggins’ paper focuses on the brigade and battalion staff as an intended audience, and does not forecast integration between CONUS and OCONUS, though he highlights the difficulties of dispersed training.²⁰ The author’s complaints of terrain databases and stovepiped system development hold value today. Understanding the work and increased capacity accomplished between 2006 and 2016 is an essential element needed to accomplish OCONUS focused training.

Turning to authors that identify specific aspects of potential solutions, “Assessing the Effectiveness of the Close Combat Tactical Trainer” by Mastaglio, Peterson, and Williams, provides insight into an important system. Again, because this piece comes from 2004, this article’s relevance for today’s units is seen not in capabilities of CCTT in 2004, but utility of the system to Army organizations. The study qualitatively assessed collective training, and then applied assessment criteria formulated by the researchers to

¹⁸ Published in the NATO journal, Virtual Media for Military Applications.

¹⁹ David W. Riggins, “The Direction of Virtual Vehicle Simulations for Military Training” (Report presented at Virtual Media for Military Applications, Neuilly-sur-Seine, France, May 2006), 13-2.

²⁰ Ibid., 13-1, 13-4.

CCTT training.²¹ These results are valuable towards the pursuit of this research's questions and purpose; the study demonstrated that units and individuals have a positive stance on the technology and want to incorporate the system in training.²² The ARI study concluded that CCTT is a viable training aid towards preparation for a live training event, which is what this research desires on a larger scale; data from this research is used in chapter 4 for analysis; but growing in scale is the backbone of the next piece of literature.

Demonstrating the growth of simulations between the timeframe of LTC Riggins' piece and today's capabilities is the "Live, Virtual, Constructive-Integrating Architecture: Integrated Training Environment Pre-Fielding User Assessment," published by Training Support Analysis and Integration Division in 2013. Note that this assessment contains a direct feedback from a unit using the LVC-IA and the author of this thesis was a company commander in the unit that took part in the assessment.

The primary improvement in simulations capability from 2006 to 2013 was in the validity of the simulations environment.²³ What LVC-IA was developed to do was create an Integrated Training Environment (ITE). Through the ITE, a training audience in a simulations system can be connected to a training event in the live environment; therefore leveraging simulations to increase those receiving training in realistic operational

²¹ Thomas W. Mastaglio, Paul Peterson, and Steven Williams, Report 1820, *Assessing the Effectiveness of the Close Combat Tactical Trainer* (Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences, 2004), vii.

²² *Ibid.*, viii.

²³ Adria Markowski, *Live, Virtual, Constructive-Integrating Architecture (LVC-IA) Integrated Training Environment (ITE) Pre-Fielding User Assessment* (Fort Eustis, VA: Training Support Analysis and Integration Directorate, 2013), 3.

environments. The importance of the first user assessment is twofold: results demonstrate the suitability of simulations training, and the feedback is supportive of increased possibilities through simulations training.

This study seeks to increase familiarity with unified action partners. This report demonstrates LVC-IA is a feasible means to accomplish this goal.²⁴ Going beyond LVC-IA capability, even just in CONUS locations, requires additional technology and therefore the next problem considered details what is available in that area.

The systems that are available to Army are comprehensively captured in the *Weapon Systems Handbook*, published by the Program Executive Office for Simulations, Training, and Instrumentation (PEO STRI). The most recent edition of the handbook, published in 2016, outlines many current and forecasted capabilities of interest.

The *Weapon Systems Handbook* covers available technology from multiple departments under PEO STRI, including Project Manager Training Devices (PM TRADE), Project Manager Instrumentation, Targets and Threat Simulators (PM ITTS), and Project Manager Integrated Training Environment (PM ITE).²⁵ The impressively detailed handbook covers for each system or technology, its mission statement, description, system interdependencies, program status, projected activities, foreign

²⁴ Markowski, 25. This assessment does not discuss or recommend training with multi-national partners but the expansion of the research here adds value to the concepts desired by this study.

²⁵ Program Executive Office Simulation Training and Instrumentation (PEO STRI), *Weapon Systems Handbook* (Orlando, FL: PEO STRI, 2016), ii-iv, accessed 19 February 2017, http://www.peostri.army.mil/Content/pdf/2016_PEOSTRI_WSH.pdf.

military sales, and contractors.²⁶ Additionally, the reader can find the sub-department in PEO STRI for each system or technology in the handbook that is in the lead as well as the program's DoD acquisition phase.²⁷ For this study, the section on PM ITE programs was the primary focus; and this section provides understanding of which system can be leveraged for the use in linked simulations training between CONUS and OCONUS. Although the Synthetic Training Environment (STE) is included in the handbook, the National Simulations Center STE whitepaper is more informative.

The Combined Arms Center-Training (CAC-T) Synthetic Training Environment White Paper describes the desired future simulations training capability for the Army. Acquired through coordination with the National Simulations Center, the white paper offers the most current information available on the STE.

The primary point the literature on the STE makes regarding simulations is that, while current systems are valuable and have made improvements, there is still a gap in realism for the training audience, meaning the systems and characteristics of the projected environments can improve.²⁸ The STE will alleviate these issues and increase the overall capability and capacity of simulations to meet the needs of today's force. The reference to both the current missions and the current threat is an important facet the literature on intentions of the STE. According to the white paper, capabilities in support

²⁶ PEO STRI, v.

²⁷ Ibid., v.

²⁸ Combined Arms Center-Training (CAC-T), "Synthetic Training Environment (STE) White Paper" (Lecture, Army Training and General Officer Leadership, Fort Leavenworth, KS, 2017), 13.

of current simulations training developed across three decades and were merely modified with software updates.²⁹ The process of merely updating has reached its limit of meeting the needs of the Army. Therefore, the STE will be unveiled as the new and improved solution for simulations training available to the force. However, it is important to note that the STE is conceptual and still in development. There is no timeframe on when the STE will be available, as development is not happening all at once, but instead over time as technology allows.³⁰

This concludes the review of simulations specific literature from the U.S. Army. Next, the research reviews elements that drive cooperation of Army units and their allies and partners.

Cooperation

As a bridge from simulations to U.S. partners, the first piece of literature concerns the operating language of command and control systems between the U.S. and NATO. Contributing members of the MSG-085 NATO simulations conference wrote an executive summary describing work to synchronize the interoperability efforts of NATO.³¹ This report shows the continued emphasis on interoperable systems and environments to increase partners' training capacity, specifically regarding the computer

²⁹ CAC-T, 2.

³⁰ Ibid., 13.

³¹ J. Mark Pullen et al., "A NATO OPORD Capability for BML" (Paper presented at the Institute of Electrical and Electronics Engineers (IEEE) Spring 2011 Simulation Interoperability Workshop, Boston, MA, April 2011), 1. This conference was oriented on synchronizing the simulations operating language between NATO and the United States.

language (schema) used to preform digital exercises.³² This article captures the recommendations of the working group at MSG-085, which show progress, but the recommendation is for continued investment into an enduring solution.³³ In later chapters, this research does not attempt to offer solutions for the schema, but validates the premise of a common language as a sound investment. This source is included as the research captures a study done by U.S. allies, and therefore eliminates potential bias of only including the U.S. point of view on simulations obstacles. While informative, this article does not cement the commitment of NATO towards simulations.

The heads of government representing the North Atlantic Treaty Organization (NATO) met in early July of 2016 in Warsaw, Poland. This meeting emphasized interoperable capabilities development, member spending on security matters, and sharing the burden of mission requirements.³⁴ The communique also notes that while the desire for increased capability exists across NATO, the decision of how and what development gets investment remains with individual members.³⁵

However, the Warsaw Communique clearly prioritizes broad solutions applicable to multiple members, spending in a manner that allows increased training opportunities, and innovation. Continued evidence of where NATO focus in capabilities development

³² Pullen, 2.

³³ Ibid., 5.

³⁴ North Atlantic Treaty Organization (NATO), “Warsaw Summit Communiqué,” 3 August 2016, accessed 3 November 2016, http://www.nato.int/cps/en/natohq/official_texts_133169.htm.

³⁵ Ibid.

lies in its positioning within the 2015 Industry/Interservice Training, Simulation, and Education Conference (I/ITSEC).

This article captures both the spirit of this project as well as strengthens the case of NATO's acceptance of simulations training. The report is on an annual conference, bringing together significant leadership from across the globe to discuss goals of the joint force and industry means available to help them accomplish those goals.³⁶ In 2015, NATO sent Vice Admiral Gonzalez-Huix, NATO Supreme Allied Command Transformation's Deputy Chief of Staff Joint Force Trainer, as a representative.³⁷ During the conference, as this article explains, he set the foundation for NATO's initiative to increase "simulations and modeling" throughout their training and education.³⁸ The alliance's positive stance towards simulations is an important aspect to the conclusions generated from this research. To affect a broader audience than just NATO, the security initiatives of the European Union (EU) also serve as a reference point.

A positive position on simulations by the EU resides in a briefing developed and issued by the Concepts and Capabilities Directorate of the European Union Military staff. The presentation shows a connection between NATO and the EU, which enables the

³⁶ Allied Command Transformation, "NATO Fully Integrated into Largest Training, Modelling and Simulation Conference in the World," North Atlantic Treaty Organization, accessed 3 November 2016, <http://www.act.nato.int/nato-fully-integrated-into-largest-training-modelling-and-simulation-conference-in-the-world>.

³⁷ Ibid.

³⁸ Ibid.

scope towards a broader audience throughout EUCOM.³⁹ The intent of the EU staff briefing is to provide an overview to the EU decision-making process. As a source, the insight to that process and the outcomes of the process also captured in the briefing serve as valuable knowledge to answering the research questions. Finally, the review of literature on cooperation concludes with a fact-based document to contribute towards potential realistic partners for both capability and capacity of linked simulations training.

A NATO press release from 2016 covering the spending of members drives understanding of two factors: feasibility and suitability. With the information provided in this release the investigator can complete a databased examination of the alliance countries to determine those most likely able to accomplish NATO (and possibly simultaneously EU) initiatives. Furthermore, analysis of the data adds a qualitative aspect of research towards nesting U.S. policy in partnerships with a feasibility check, which produces recommendations and conclusions that are more legitimate. With the security focus of the United States, NATO, and the EU sharing some common ground, the next area examines what threat is most likely.

Potential Threats

Although numerous sources, already discussed, specifically name Russia as a “competitor” or concern from a security perspective, none of those documents paint a picture of an inevitable war with Russia (or any other nation state). Because state-on-state, conventional warfare seems unlikely, based on the current global environment as

³⁹ Klaus Schadenbaur, “EU Military Capabilities: CSDP Orientation Course” (PowerPoint presentation, EU Military Staff, 2016), slide 3.

well as these security initiatives, the next source frames the nature of the threat anticipated, especially prominent in the European theater.

“Mastering the Gray Zone: Understanding a Changing Era of Conflict” is a monograph written by Michael J. Mazarr in December 2015. The author is currently the Associate Director, Strategy, Doctrine, and Resources Program of the RAND Arroyo Center and Senior Political Scientist, and further investigation of his bio shows a lifetime spent devoted to strategic level development and planning.⁴⁰ Dr. Mazarr is not the only author to publish thoughts on gray zone conflict, but through the course of this research, his contributions to the concept were discovered in a variety of forums. Examples of his published work include the blog, “War on the Rocks,” his presentation to the Strategic Multilayer Assessment on the ARCIC website, and a monograph found at the U.S. Army War College Strategic Studies Institute. All of that, in combination with his position at the RAND Corporation, establishes his credentials as an expert about the gray zone concept.

The monograph is comprehensive in pulling from past academic work on other types of warfare to provide the elements of Dr. Mazarr’s definition of gray zone conflict, and how it works. Through eight chapters, Dr. Mazarr presents, argues, challenges, and offers solutions to his theory on gray zone conflict. A drawback of the source is the monograph focuses at the strategic level. However, the framework of the gray zone concept creates understanding of the replicated training environment needed in simulations. Those characteristics are best captured in these figures from Dr. Mazarr.

⁴⁰ RAND Corporation, “Michael J. Mazarr Biography,” accessed 5 March 2017, http://www.rand.org/about/people/m/mazarr_michael_j.html.

Table 1. Gray Zone Tools and Techniques

	Economic	Military / Clandestine	Informational	Political	Other
High End	<ul style="list-style-type: none"> • Blockade • Severe sanctions • Energy coercion 	<ul style="list-style-type: none"> • Nuclear posturing • Movements of troops, threats • Creation of fait accompli situations • Large-scale covert actions to weaken regime • Discrete acts of violence at key moments • Use of UW forces (SOF, covert operators) in direct action with deniability • Sponsoring large scale proxy violence 	<ul style="list-style-type: none"> • Major propaganda campaigns • Large-scale deception and denial to conceal revisionist intent 	<ul style="list-style-type: none"> • Support for domestic opposition, exiles, guerrillas, militias • Major claims in global forums to support revisionist intent; urgent efforts to change rules, distribution of goods • Conclude formal alliances • Sign treaties 	<ul style="list-style-type: none"> • Large scale cyberattacks • Use of nonmilitary assets (coast guard, fishing fleets) to create de facto presence
Middle Ground	<ul style="list-style-type: none"> • Targeted sectoral denial • Limited sanctions 	<ul style="list-style-type: none"> • Large-scale exercises • Signaling • Moderate covert actions for leverage or specific goals • Sponsoring moderate proxy activities • Expand/revise military presence in regions/states 	<ul style="list-style-type: none"> • Develop and publicize historical narrative • Moderate propaganda campaign 	<ul style="list-style-type: none"> • Dialogues with adversary political opposition • Moderate efforts in international forums to revise rules • Establish regional concerts 	<ul style="list-style-type: none"> • Cyberharassing, targeted cyber actions
Low End	<ul style="list-style-type: none"> • Trade policies • Implied economic coercion 	<ul style="list-style-type: none"> • Small-scale covert actions for modest goals • Low-level backing for proxy attacks 	<ul style="list-style-type: none"> • General information diplomacy 	<ul style="list-style-type: none"> • Use of global forums to assert goals on persistent basis • Networks, Track 2 efforts 	<ul style="list-style-type: none"> • Low-level, ongoing cyber activities

Source: Michael J. Mazarr, “Mastering the Gray Zone: Understanding a Changing Era of Conflict,” Strategic Studies Institute, December 2015, accessed 5 March 2017, <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=1303>.

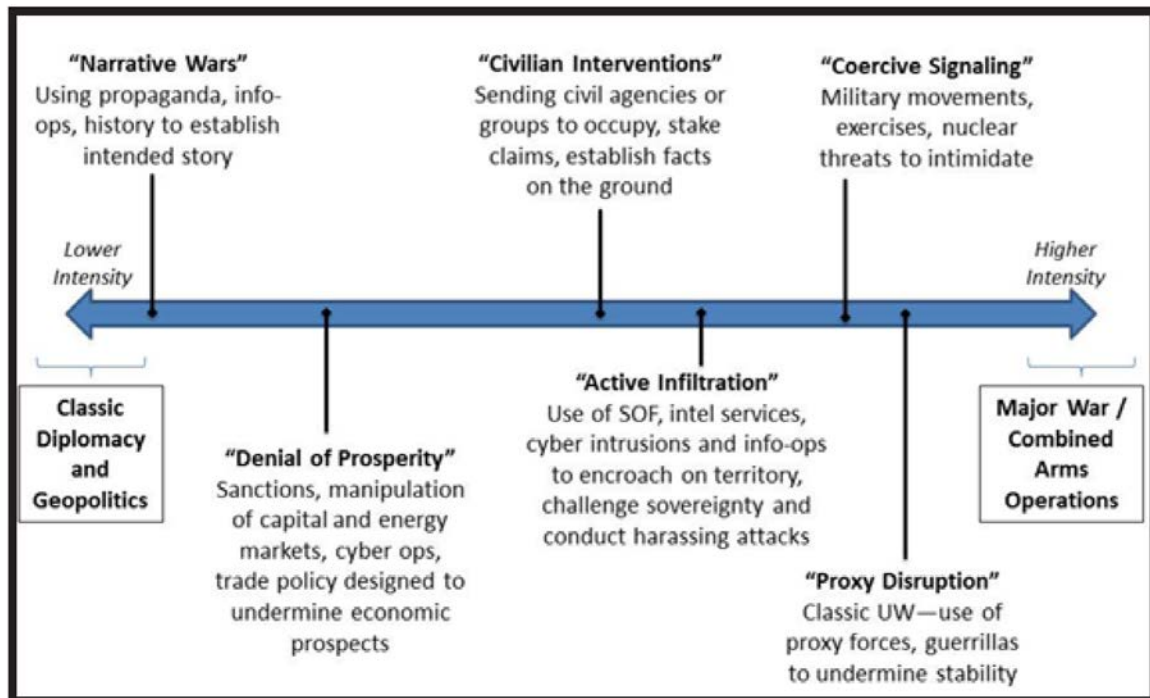


Figure 1. A Spectrum of Gray Zone Techniques

Source: Michael J. Mazarr, "Mastering the Gray Zone: Understanding a Changing Era of Conflict." Strategic Studies Institute, December 2015, accessed 5 March 2017, <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=1303>.

Overall, the concept of gray zone conflict is appealing for a training audience. The concept affords information to Army organizations on a current threat signature to replicate in their training environment. To date, this type of threat is being seen in Europe, influencing many of the allies and partners of the U.S. Army.

One other piece of work adds value in the potential threat category. Author Jakub Grygiel presents an interesting idea in his article, "Arming Our Allies: The Case for Offensive Capabilities." His argument is for a change in the strategic guidance for how the United States supports deterrence. He focuses on Europe and gives an overview of the current methodology for the United States. That stance affirms our allies' defensive

nature and capabilities, which in turn, allows for a projection and build-up of U.S. combat power in the area to deny an aggressor action within another sovereign nation. Mr. Grygiel argues for a change from the defensive mindset, arguing instead that the U.S. should be an advocate for offensive capabilities and mindset with those allies. The strategic nature of the article limits the usefulness of the concepts; however, the mentality of the author is one that can provide a source for recommendations of this research.

Summary and Conclusions

Timeliness and specificity of literature available to the exact concept of linking simulations training to multinational partners from CONUS to HST does not exist. However, that empowers the purpose of this study, and affords an ability for this research to synthesize stovepiped literature into a collaborative working concept. Those stovepipes codified during research as mission, simulations, cooperation, and potential threat and the literature from those areas has been reviewed in detail.

There is substantial evidence contained in individual documents that supports a greater emphasis on simulations training to support RAF. The next step is to establish the links between the areas to make this fact evident, and then provide a lens of how current training operations are leveraging simulations in a similar fashion to enable this study to offer recommendations on a way forward.

CHAPTER 3

RESEARCH METHODOLOGY

This study seeks to expand the options available to U.S. Army unit training strategy using simulations, specifically when the unit has a RAF mission. To frame the research relevant to simulations training and ensure the primary and secondary research questions are answered, comparative document analysis was selected as the methodology. This method allowed exploration and then synthesis of pertinent information across broad categories to find and generate potential options for Army training at the tactical level. A case study examined current simulations used in training conducted by the U.S. Army and multinational partners. The combination of these two approaches informed a gap analysis to foster solutions and recommendations to solve the gaps. Throughout this chapter, a description of the design affords the bridge from methodology to the findings.

First, the following diagram shows the thought process. Using the diagram as a handrail, allowed the research to stay oriented on the research questions and helped determine appropriate source materials for use.

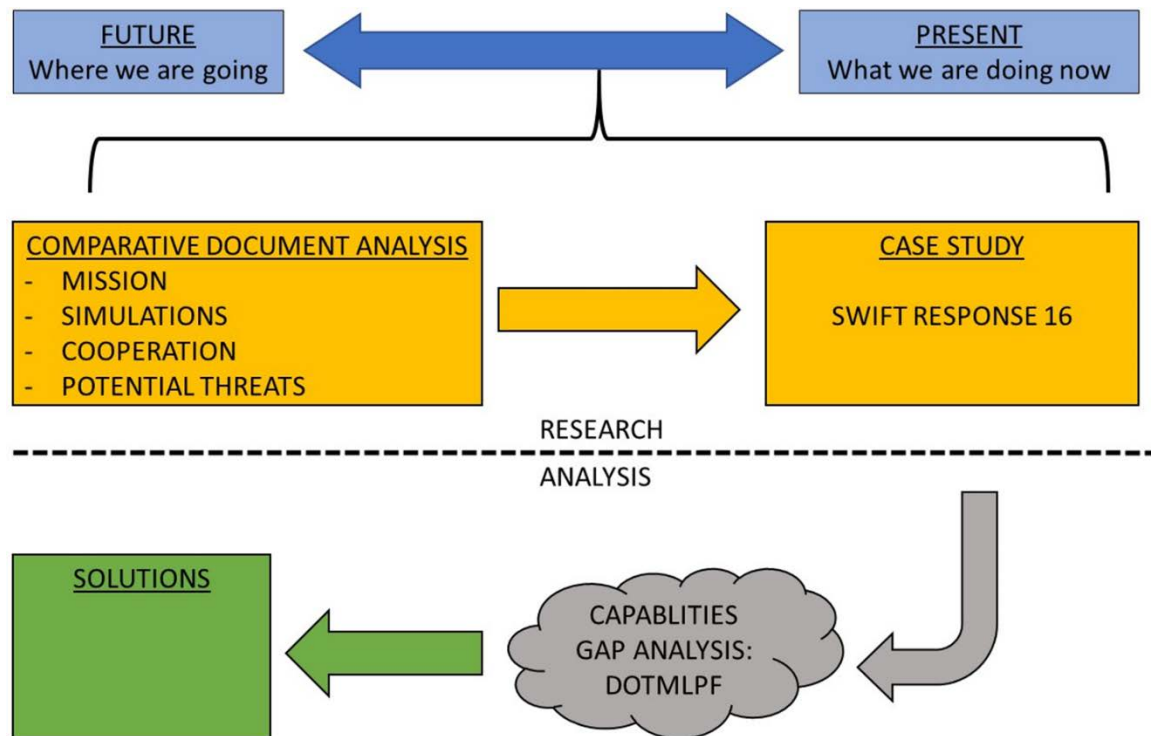


Figure 2. Author's Visual Model of Research Methodology

Source: Created by author.

In this methodology, the key sources are the foundation documents of Army doctrine and military institutions.⁴¹ This focus screened out evaluation of the present state of Army training or simulations systems, and retained focus on generating potential opportunities within Army training. Additionally, this screening effort shaped the literature review around the four key categories: mission, simulations, cooperation, and potential threat. This framework was useful for organization of the source material, but this study used DOTMLPF for analysis. Answering the secondary questions through the

⁴¹ "Military institutions" is a broad term that for the purposes of this study included the likes of SAMS, Strategic Studies Institute, the Army War College, and RAND as examples. These places have a direct link to publishing for the military.

document review delivered the core knowledge to perform a DOTMLPF gap analysis, and identify the key capabilities necessary to accomplish linked simulations training. But the study also wanted to show the current state of CONUS to OCONUS partnered training through research.

To understand training above the tactical level, this study examined a case from EUCOM from a training event titled, “Swift Response 16,” provided by USAREUR planners of the exercise. The case study materials include the Initial Planning Conference and Mid Planning Conference briefings, and the After Action Review of the exercise. Review of Swift Response 16 as a training event augmented the baseline DOTMLPF analysis.

Another line of research was engaging subject matter experts in simulations and EUCOM training. Although no formal interviews occurred, both the National Simulations Center and the JMRC simulations officer contributed to this project. In both instances, feedback indicated that the tactical-level audience is not a current focus point for CONUS to OCONUS-connected training; however, those consulted said the value of investigating the potential training is a relevant topic.

In summary, consulting a broad range of military doctrine and multinational partners’ policies was necessary to offer potential options towards tactical level training through simulations with U.S. Army allies and partners. Not focusing on an existing system or concept required a comparative analysis rather than detailed case study of examples. However, current operations occurring in the U.S. Army at higher echelons provide context for simulations training from CONUS to OCONUS. This study uses one such example from the EUCOM theater to illustrate the concept.

CHAPTER 4

ANALYSIS

Both simulations and the RAF mission are central to conduct CONUS to OCONUS training with our multinational partners. To generate options for the U.S. Army unit training strategy, the research questions guided the analysis towards understanding where gaps in capabilities exists for this concept through DOTMLPF. Answering the secondary questions through the research approaches produced results of Doctrine, Organizations, Personnel, and Facilities as areas that have capabilities existing to support this concept of training. While studying for the answers to the secondary questions Training, Materials, and Leadership and Educations evolved as the categories where capabilities gaps are preventing linked simulations training. Proving the answers to secondary question answers, the primary research question, “How can U.S. Army units conduct home station training at the tactical level that is linked to multinational partners in a realistic environment that enables mission readiness?”

As the secondary questions were analyzed, their answers combined to provide evidence in DOTMLPF areas. Through this chapter, the evidence to support DOPF having necessary capabilities is presented first. With that understanding, the case study showed application of those capabilities, but also highlighted some of the areas where gaps are present. Lastly, an answer to the primary research question is presented based the outputs of the document analysis and review of the case study.

Concerning Doctrine and Organizations, four of the secondary questions produced the data during research. The first question is why would this type of training be of interest to the Army? To answer, a stair step from national strategic level literature down

to tactical level application explains why. At the top of the chain is the NMS, which gives context of the broad strategic environment, strategy towards training, and some insight to a national vision of what type of leaders the military is striving to employ.

The NMS description of the strategic environment in section I is not narrow and, therefore, many areas across the globe require attention from the military. However, two significant elements of the environment are noteworthy. First, the NMS identifies states (sovereign nations) as the dominant actor in the international system, and that these require the U.S. military's predominant attention.⁴² Second, the NMS clearly identifies Russia as a major challenge. The language used is careful not to paint Russia as an enemy; but areas of concern, such as Russia's disregard for other sovereign neighbors and lack of adherence to signed treaties and agreements, are stated in the document.⁴³ Russia is a state actor that EUCOM would address, and some of the challenges they present should be the focus of unit training for the RAF mission to EUCOM. This aspect of the NMS drives ABCTs that would fill the EUCOM RAF mission to seek as many opportunities to train with partners as possible. Moving through the NMS, further evidence of interest for training opportunities resides in sections III and IV.

Section III: An Integrated Military Strategy justifies multinational training at the national level. This section provides national military objectives, and one is "strengthen our global network of allies and partners."⁴⁴ Key features of this objective are emphasis

⁴² Joint Chiefs of Staff, 2.

⁴³ Ibid.

⁴⁴ Ibid., 5.

on training and exercises with U.S. partners and allies, and globally integrated operations.⁴⁵ The NMS establishes a commitment to training and exercises with multinational partners. This argues that simulation is a reasonable way to accomplish these endeavors.⁴⁶

Section IV: Joint Force Initiatives provides insight into the qualities and attributes the Joint Force wants from leaders; most notably is the emphasis on more innovation from those leaders. The section outlines how the military can shape policy and procedures to best meet the needs of the generation coming into the ranks. The component of section IV that helps answer research questions is the third category of fostering initiative: developing flexible, interoperable capabilities.⁴⁷ The NMS does not expand much on this facet, but clearly, the Joint Force is pushing to find innovative means to manage the other components of the strategy. The concept of simulations training linked from an Army unit at home station to a multinational partner in Europe (OCONUS) is innovative because no one is using this at the tactical level, and the idea is flexible due to being applicable in a variety of locations available to the U.S. Army and multinational partners. The NMS affords proof why, at the strategic and operational levels, the Army should have interest in this type of training. Continued evidence complementary to this idea also exists in Army documents.

⁴⁵ Joint Chiefs of Staff, 9-10.

⁴⁶ Ibid., 10. The other key components are seizing, retaining, and exploiting the initiative; leveraging global agility demonstrating flexibility in establishing joint forces; improving cross-domain synergy; and being increasingly discriminate to minimize unintended consequences.

⁴⁷ Ibid., 9.

The AOC addresses, in greater detail, the direction and actions expected of the Army in relation to multinational partnerships across the globe, emerging technology, and readiness.⁴⁸ The AOC is clear that Army units will “engage regionally” and “respond globally.”⁴⁹ The ideas within the AOC set the conditions for an operational concept based around finding as many possible ways to conduct military-to-military engagements with our partners as possible. Even though simulations do not physically place Army units around the globe, training within them does “engage regionally” through partners and increases unit understanding of global environments they will operate. The War College thesis on RAF continues to provide evidence to support why this type of training would be important by presenting the operational version of the AOC’s concepts.

A significant point this document makes is that Army planners understood RAF as a “concept, not a change in doctrine.”⁵⁰ Two elements of the War College article’s explanation on implementation aid in answering secondary questions: authorities and audience. According to the War College study, the RAF concept creates a new term of “aligned,” which now is called Service Retained Combatant Command Aligned (SRCA).⁵¹ The other aspect of the War College study is the intended audience of RAF.

⁴⁸ U.S. Army, TRADOC Pamphlet 525-3-1, 13-15.

⁴⁹ Ibid., 17. The other categories are develop situational understanding through action, conduct joint combined arms, sustain high tempo operations, establish and maintain security, consolidate gains, respond to and mitigate crisis in the homeland, and ensure institutional and operational synergy.

⁵⁰ Cantwell, Orwat, and Warren, 139.

⁵¹ Yuenger, 2-7. Alignment is determined through the Mission Alignment Order (MAO) two years out, giving units more time in their training cycle to integrate known environments and partners they will work with during their mission.

As articulated in the historical context portion of the document, “this concept is for the total army.”⁵² Because RAF authorizes units, two years before execution, to establish training with known partners and in well-defined operational environments plus being applicable to all Army units then when RAF is combined with the AOC imperatives the outcome demonstrates that the Army should be interested in as many ways as possible to train with our multinational partners. Doctrine compels the Army to train with our partners, but how does simulations training affect Army organizations?

FM 7-0, *Train to Win in a Complex World*, answers this question. The findings focus on elements of chapter 1 and chapter 2 from the manual. Chapter 1 contains the principles of training and training proficiency ratings, which are the core concepts for understanding that simulations positively affect Army units to improve readiness.

With the principles of training, although there are ten provided in the manual, when assessing training for a RAF mission with the concept of simulations four stand out.⁵³ These four are, train as you fight, train to sustain, train to maintain, and training is multi-echelon and combined arms. The next focus point is training proficiency ratings, which simply put is the measurement of a unit’s preparation to execute an assigned task or mission. The manual breaks down the rating structure as “T” is fully trained, “T-” is trained, “P” is practiced, “P-” as marginally practiced, and “U” is untrained.⁵⁴ Then there

⁵² Cantwell, Orwat, and Warren, 140.

⁵³ U.S. Army, FM 7-0, 1-1. The other six principles are: Training is commander driven, Training is led by trained officers and noncommissioned officers (NCOs), Train to standard, Train using appropriate doctrine, Training is protected, and Training is resourced.

⁵⁴ Ibid., 1-2.

is the “band of excellence” theory, which links the ratings to time. FM 7-0 says, “Effective commanders take the unit from a training start point, attain the required training proficiency, and maintain that proficiency over time.”⁵⁵ Through the rating structure and band of excellence, proficiency over time is a key aspect of training methodology and simulations can have effects to increase success. The tables below illustrate these methodologies.

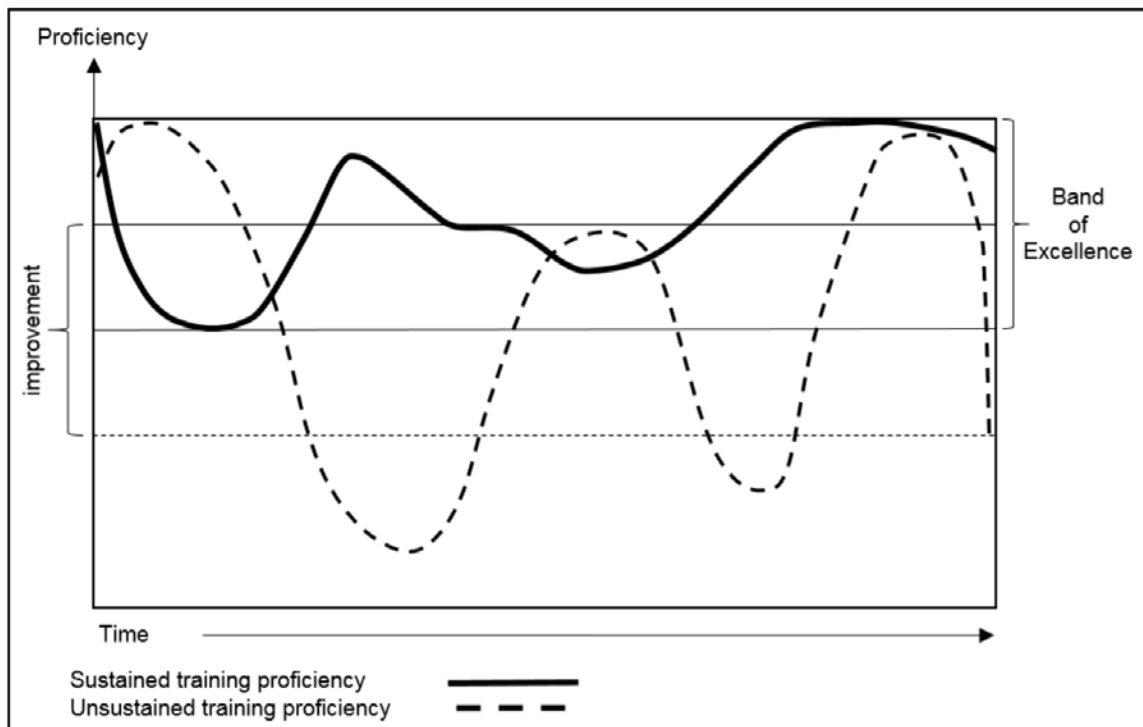
⁵⁵ U.S. Army, FM 7-0, 1-3.

Table 2. Objective Task Evaluation Criteria Matrix

Plan and Prepare				Execute						Assess		
Operational Environment				Training Environment (L/M/C)	% Leaders present at training/authorized	% Present at training/authorized	External evaluation	Performance measures	Critical performance measures	Leader performance measures	Task assessment	
SQD and PLT	CO and BN	BDE and above										
Dynamic (single threat)	Dynamic and complex (4 + OE variables and hybrid threat)	Dynamic and complex (all OE variables and hybrid threat)	Night	Proponent establishes training environment standards	≥85%	≥80%	Yes	≥90% GO	All	≥90%	T	
					75-84%			80-90% GO		80-89%	T-	
Static (single threat)	Dynamic (single threat)	Dynamic and complex (all OE variables and single threat)			65-74%	75-79%		65-79% GO		<All	<80%	P
					60-64%			60-74%				51-64% GO
	Static (single threat)	Dynamic & complex (< all OE variables and single threat)	<60%		<60%	<51% GO	U					
Task Dependent					Task Independent							
BDE	brigade	OE	operational environment						T	fully trained		
BN	battalion	P	practiced						T-	trained		
C	constructive	P-	marginally practiced						U	untrained		
CO	company	PLT	platoon					V	virtual			
L	live	SQD	squad									
Note: The percentages used in this figure are for illustration only. See the collective task's published training and evaluation outline for the applicable percentages.												

Source: U.S. Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Department of the Army, 2016), B-5, accessed 10 February 2017, http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%207-0%20FINAL%20WEB.pdf.

Table 3. Sustaining Proficiency with a Band of Excellence



Source: U.S. Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Department of the Army, 2016), 1-3, accessed 10 February 2017, http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%207-0%20FINAL%20WEB.pdf.

These charts from FM 7-0 represent a change in the measurement of readiness that the Army adopted in the last few years; one that makes the reportable status of a unit more objective and less subjective by the chain of command. The concept of linking training to a partner in simulations would act as a step to sustain readiness over time, especially in RAF. As units get closer to the execution of a RAF mission, they experience a gap in time where their equipment is in transit. During this time, a unit could exploit simulations training to keep their proficiency rating high. Further evidence from chapter 2 of the FM shows ways to incorporate these technologies into training.

This chapter in FM 7-0 delivers the fundamentals of applying the operations process to an enduring training plan for a unit. For this study, two areas of the chapter are important: the crawl-walk-run methodology and mix live, virtual, and constructive training environments.⁵⁶ First, the crawl-walk-run methodology provides a structure to from simple to complex training so that soldiers have the greatest opportunity for retention of tasks and increased proficiency across the sequence.⁵⁷ Figure 3 (below) is a simple diagram of how crawl-walk-run works. This methodology is a doctrinal basis for sound training, and the same principles should apply to multinational training in that Army units are afforded opportunities to crawl-walk-run with their partners.

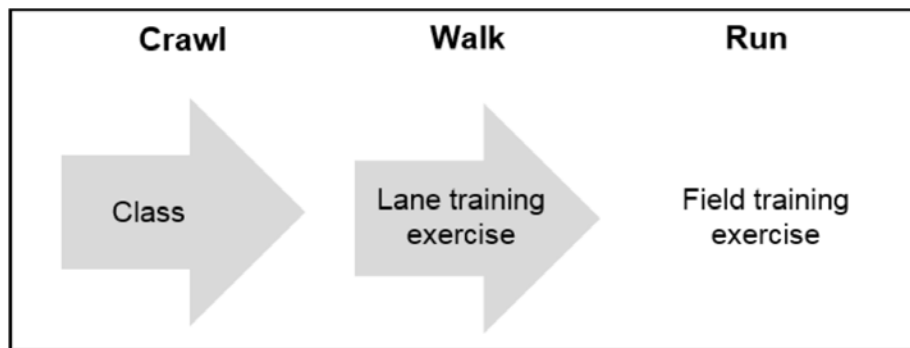


Figure 3. Sample of Crawl-Walk-Run Training Events

Source: U.S. Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Department of the Army, 2016), 15, accessed 10 February 2017, http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%207-0%20FINAL%20WEB.pdf.

⁵⁶ U.S. Army, FM 7-0, 2-1.

⁵⁷ *Ibid.*, 2-15.

Chapter 2 also discusses the importance of commanders to mix live, virtual, and constructive training environments.⁵⁸ The manual discusses the purpose of each environment and how they function. Live is traditional unit training; virtual uses simulations, but is focused on motor-skills, decision-making, and communication between individuals and crews; and constructive uses simulations focused at the collective level to exercise command and staff functions.⁵⁹ All these environments are desirable to units training with multinational partners, and the effects of such training would be a more capable combined force. FM 7-0 uses an excellent chart to show a method of when and how to mix the environments, shown below.

⁵⁸ U.S. Army, FM 7-0, 2-16.

⁵⁹ Ibid., 2-16, 2-17.

Table 4. Sample LVC Training Mix from Brigade to Individual Soldier

Several Options: Commanders Determine the Mix									
	Leaders			Staffs			Units		
	Crawl	Walk	Run	Crawl	Walk	Run	Crawl	Walk	Run
Brigade	L/V/C	L/V/C	L/V/C	L/C	L/C	L/V/C		L/V/C	L/V/C
Battalion	L/V/C	L/V/C	L/V/C	L/C	L/C	L/V/C		L/V/C	L/V/C
Company	L/V	L/V	L				L/V	L/V	L
Platoon	L/V/C	L/V	L				L/V	L/V	L
Crew/Squad	L/V/C	L/V	L				L/V	L/V	L
Individual	L/V/C	L/V/C	L	L/V	L/V	L	L/V	L/V	L
C	constructive		L	live		V	virtual		

Source: U.S. Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Department of the Army, 2016), 2-18, accessed 10 February 2017, http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%207-0%20FINAL%20WEB.pdf.

An additional element from FM 7-0 is the two types of simulations-specific training environments. The “how” behind mixing LVC is accomplished in either the blended training environment or the integrated training environment.⁶⁰ A clear differentiation of the two is that while both mix LVC, blended refers to concurrent training in two of LVC, but lacks connection of those into a singular training event. Integrated, therefore, is the environment that has the necessary architecture to connect simultaneous training using multiple LVC means into a collaborative and nested training

⁶⁰ U.S. Army, FM 7-0, 2-17.

event.⁶¹ The FM clearly lays out standards and acceptable ways for training which simulations are undeniably included in that classification. Simulation can either serve as the baseline to multinational training in the crawl or walk phase. Another fact of a RAF mission is live training with multinational partners occurs early and often. Currently in EUCOM, the U.S. Army conducts numerous operations monthly with our partners. Instead of having to spend valuable time and resources in a live training environment doing discovery learning between U.S. and partner formations these simulation events would serve to foster awareness early in the training relationship. Both doctrinally and organizational the U.S. Army does not have a gap in capabilities to conduct linked simulations training. Still, for other organizations pertaining to this concept, what drives NATO and EU priorities in defense, security, and military development?

EUCOM, NATO, and the EU were the organizations examined, as these entities comprise relevant partnerships. During the investigation, a clear acceptance of simulations training with partners is found, and capabilities in doctrine, organization, personnel, and facilities are apparent. In discovering how NATO and the EU establish priorities several similarities to the U.S. guidance arose in their documents.

Functioning in a similar fashion to the NMS for the U.S. is the NATO's "Active Engagement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization" setting the direction for the organization. A clear and strong partnership with the U.S. in all matters of security is desired in the strategy; in every phase of security from development to training and

⁶¹ Ibid., 2-17.

through execution of missions.⁶² This strategy calls for a reliance on collaboration across the member nations, as this method is best from the fiscal aspect and the most conducive to successful combined operations.⁶³ NATO is also determined to have a robust partnership with the EU and to ensure that in the areas of defense, security, and military development these two organizations are complementary to one another in capabilities. NATO adopted this strategy in 2010; and because the organization is made up of several nations, rather than have a document in the nature of the AOC, NATO functions summits to update and confirm the direction of this strategy. The most recent was in Warsaw in July of 2016.

The NATO communique from the Warsaw summit contributed understanding of the decisions that are aligning the organization's countries in security matters. Point 33 states, "Increased investments should be directed towards meeting our capability priorities. It is essential that Allies display the political will to provide required capabilities and deploy forces when needed. Allies also need to ensure forces are deployable, sustainable, and interoperable."⁶⁴ This point in the agreement is compelling evidence member nations are committed to "interoperable" solutions and meeting their security commitments; this study argues increased training opportunities is a step NATO is committed to taking. The next point of the communique (34) continues to support the

⁶² North Atlantic Treaty Organization (NATO), *Active Engagement, Modern Defence: Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization* (Brussels, Belgium: NATO Public Diplomacy Division, 2010), 6-34.

⁶³ NATO, "Warsaw Summit Communiqué."

⁶⁴ Ibid.

concepts of this study. The issue addresses NATO spending towards security of members.⁶⁵ Point 34 acknowledges that progress has been made, and five members are meeting the agreed mark of both 2 percent GDP as well as 20 percent within the defense budget towards areas like research and development.⁶⁶ However, this point also expands to validate that while many countries are contributing to missions there needs to be a greater emphasis on sharing the burden.⁶⁷ Infrastructure alignments and capabilities are the priority for investment.⁶⁸ Increased capacity in these areas is in the best interest of mission requirements, and steps need to be made to validate a greater understanding of how each country's military force can be applied to fulfill all requirements of NATO.⁶⁹

Point 45 validates that capabilities gap solutions could have a cascading effect. If the right partners are selected initially and clear understanding can be codified for others to mirror and align resources to accomplish these solutions in shorter time. The point urges "multinational" solutions to be adopted whenever possible, but places these decisions on the individual members.⁷⁰ The question remaining for both NATO and the EU is would simulations be a field worth investment to achieve these goals.

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Ibid.

Two publications from NATO reflect a commitment to simulations development. NATO PAO published an article about the 2015 Industry/Interservice Training, Simulation, and Education Conference (I/ITSEC) which indicates NATO's acceptance of simulations training. In 2015 Vice Admiral Gonzalez-Huix, NATO Supreme Allied Command Transformation's Deputy Chief of Staff Joint Force Trainer, set the foundation for NATO's initiative to increase "simulations and modeling" throughout their training and education.⁷¹ NATO's Modelling and Simulations Group (MSG) workshop in 2011 worked to develop an OPORD template that could be used across exercise platforms of individual countries; by standardizing the computer language (schema) which systems speak to each other and what data that those systems are delivering to one another.⁷² Both of these sources show a commitment by NATO to understand what obstacles exist in simulations training and to invest resources into development of solutions. The EU displays an equal appetite for simulations.

A briefing of EU capabilities acquired from the EU military staff was used to assess their acceptance level and desire for training with simulations. The 2014 EU Capabilities Development Plan's "Priority Actions" identifies specifically the need for "Modeling, Simulations, and Experimentation."⁷³ The concept of linked simulations appears not only acceptable, but also desired by most NATO and EU partners.

⁷¹ Allied Command Transformation, 1.

⁷² Pullen, 3-4.

⁷³ Schadenbaur, slide 31. A progress catalog is the final document in the capabilities development model used across EU member states; that catalog in 2014 determined simulations as a shortfall across members.

From the report, “Defence Expenditures of NATO Countries (2009-2016)” the three most likely countries to have the means, and the most to gain, to invest in capabilities for linked simulations would be the United Kingdom, Estonia, and Poland. These three invest at the 2 percent level, and invest the most heavily in defense equipment.⁷⁴ Romania and Lithuania also show potential, as their projected spending would meet the requirements. The UK, Estonia, Poland are heavily involved in current operations with the U.S. and the RAF mission in EUCOM, and therefore would find this type of training beneficial. Each country mentioned are members of both NATO and the EU, and recently have shown a desire to make an investment into as many potential training solutions as possible. A review of organizations and their doctrine revealed a desire for partnered training, and accounting for defense spending indicates which partners from the organizations are best suited for this type of training to be acceptable and feasible ways forward. To account for the remaining elements of Training, Materials, Leadership and Education, Facilities, and Personnel the secondary questions of this research associated with simulations provided the best information.

To learn about the existing capabilities within the simulations realm of the U.S. Army the primary source is the PM ITE section of the PEOSTRI Weapons Handbook. The U.S. Army Games for Training (GFT) Program, Synthetic Environment Core, CCTT, and LVC-IA are all introduced in the handbook, and represent the key material

⁷⁴ North Atlantic Treaty Organization (NATO), “Defence Expenditures of NATO Countries (2009-2016),” 4 July 2016, 2, accessed 23 February 2017, http://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2016_07/20160704_160704-pr2016-116.pdf. Research and development costs are captured within equipment expenditure according to the press release, which is the reason that area was considered as part of the assessment.

solutions of the purposed training concept.⁷⁵ This existing technology can be critical in linking simulations training.

The Synthetic Environment Core has been developed and currently (through fiscal year 17) being delivered in portions across the Army to, “enable the entire training audience to see the same terrain, buildings, and vehicles across the Integrated Training Environment (ITE).”⁷⁶ Significant attributes of this capability are that a “Common Virtual Environment” with specific attention to a terrain database and that the core is meeting the desired effect of linking to existing simulations systems.⁷⁷ CCTT and the LVC-IA are systems of note that the core is (as an update) being applied to in the Army.

“Assessing the Effectiveness of the Close Combat Tactical Trainer,” by Mastiaglio, Peterson, and Williams, determined that CCTT is a “critical capability” when a unit is building through a training progression towards a major LFX.⁷⁸ The authors broke their study into six issues and five have a tangible impact on understanding towards this study; the sixth does not because the focus was on fixed site CCTT performance in meetings their contractual obligations as of 2004.⁷⁹ The remaining issues provide evidence from leader feedback that the CCTT is a helpful and useful system during training. The common theme is that CCTT is perceived as a “training enhancer” at all

⁷⁵ PEO STRI, 67, 75.

⁷⁶ Ibid., 74.

⁷⁷ Ibid.

⁷⁸ Mastaglio, Peterson, and Williams, 25-26.

⁷⁹ Ibid., 3.

levels, and drastically so at the company level.⁸⁰ Participants almost universally viewed this system as an enhancement to training in the preparation for live training events.⁸¹ CCTT alone does not provide a mechanism to accomplish multinational training but the system does deliver a viable existing capability to leverage for linked simulations training with multinational partners.

Beyond CCTT, a more significant piece of technology is LVC-IA. The use of LVC environments in training is acceptable in the U.S. Army. The integrating architecture (IA) is the technology that enables training across environments within simulations. The “Live, Virtual, Constructive-Integrating Architecture (LVC-IA) Integrated Training Environment (ITE) Pre-Fielding User Assessment” highlighted two key components of LVC-IA.⁸² One is the integrated environments increased the available battlefield space and represents (extremely well) true operational environments.⁸³ The other is the ability to train and synchronize multiple warfighting functions within the integrated environment, and at multiple echelons such as brigade and battalion level.⁸⁴ Although the current state of simulations allows for staff exercises on a multinational map, this first user assessment shows the ability for LVC-IA to place company level

⁸⁰ Ibid., 13, 21.

⁸¹ Ibid., 14.

⁸² Markowski, 23.

⁸³ Ibid., 24.

⁸⁴ Ibid.

formations into the integrated multinational environment.⁸⁵ While many limitations and concerns in the report came from the company level this document still represents benefits as the report demonstrates LVC-IA as a feasible means to produce increased training opportunities with unified action partners.⁸⁶

The U.S. Army Games for training (GFT) program provides a significant contribution to this study. The primary take away is from the mission and description of the GFT program, which indicates this program “comprehensively trains company-and-below formations” through Virtual Battlespace 3 (VBS3); and VBS3 has the capacity to integrate across LVC.⁸⁷ The handbook says VBS 3 “is compatible with Distributed Interactive Simulation (DIS) and High Level Architecture (HLA) in order to provide integration with live, virtual, and constructive architectures.”⁸⁸ The program’s capability to integrate with LVC-IA is excellent for this research, but the foreign military sales are the linchpin to the programs’ importance. Countries of note that have the system are Latvia, Romania, and Poland; all of which are EUCOM partners or allies, and also have training operations with U.S. forces on a routine basis.⁸⁹ The PEO STRI handbook

⁸⁵ Ibid., 6.

⁸⁶ Ibid., 25. This assessment does not discuss or recommend training with multinational partners but the expansion of the research here adds value to the concepts desired by this study.

⁸⁷ PEO STRI, 75.

⁸⁸ Ibid.

⁸⁹ The researcher has personal experiences and professional knowledge about on-going EUCOM operations with these countries.

indicates that the premise of this study is feasible; small units in CONUS can conduct simulation training with EUCOM located multinational partners.

While gaming technology offers a feasible option to conduct linked training with multinational partners from CONUS to OCONUS this capability alone does not fully answer the primary research question, because gaming technology does not increase mission readiness drastically nor does the capability provide a robust replication of the operational environment to the users. The other technology described in this section would alleviate those factors, but only absent current constraints of that technology. Constraints, however, are present and these obstacles mostly fit into two types: foreign military sales and interoperability. Among the three technologies discussed, the synthetic environment core, CCTT, and LVC-IA; none have been sold to a foreign military.⁹⁰ Zero military sales alone are not enough evidence that simulations are not a viable means of training from CONUS to OCONUS. However, the fact does present an obstacle. Additional mitigation to a lack of foreign militaries having these capabilities is that many systems are at OCONUS U.S. installations within reach of our partners. However, nesting back to a realistic operational environment, not all our partners use U.S. platforms so CCTT for example would have limited impact through this example.

If interoperability between U.S. simulators and multinational simulators were more prominent, that would have massive impacts to U.S. ability to conduct linked training. This constraint though is the most damaging to feasibility of the concept of training between CONUS and OCONUS with multinational partners. LTC Riggins

⁹⁰ PEO STRI, 69, 73-74.

outlined a contributing factor limiting such interoperability in his piece when advocating for less stovepiping among developers. In 2006, his predominant argument of necessary change was in the “interoperability of systems” to the variety of environments.⁹¹ The system’s inability to connect L-V-C across echelons was his primary target.⁹² He argued that the system developers had to re-look their approach to ensure they addressed the current (2006) shortfalls.⁹³ A significant supporting point that LTC Riggins introduces, that this study must address, was the shortfall of terrain databases and models.⁹⁴ Exceptional gains have occurred in those areas, and continued progress is a priority in the simulations field. However, little has been overcome in the system interoperability, but U.S. partners are starting to increase their desire for change in this status quo as seen in NATO and EU policies. A gap in material solutions exists for CONUS to OCONUS linked simulations training, but experts consulted during research show better capabilities in both facilities and personnel.

The Joint Multinational Readiness Center (JMRC) simulations officer, LTC William Higgins, brought to light two important facets of the current operations for this study: simulations infrastructure available and the Multilateral Interoperability Programme (MIP). Training via simulations with partners is occurring, but that training is mostly leveraging U.S. Army resources such as the infrastructure available at JMRC.

⁹¹ Riggins, 13-4.

⁹² Ibid., 13-5.

⁹³ Ibid., 13-6.

⁹⁴ Ibid., 13-3.

When discussing operations away from JMRC with LTC Higgins he mentioned the value and usefulness of “distributed” capability. This is when the simulations team in Europe builds the simulation database used in an exercise and then pushes the data to the local systems and networks of participating units.⁹⁵ LTC Higgins noted many constraints with distributed training, most notably the “compatibility of simulation models.” The Multilateral Interoperability Programme (MIP) appears to be a direct response to that issue.






























The Multilateral Interoperability Programme is a commitment by several nations to increase the interoperability of systems.⁹⁶ This is not a NATO program but NATO supports the MIP and many countries taking part in MIP are part of NATO. The goal of the program is specifically “to become the principal war fighter-led multinational forum to promote international interoperability of Command and Control Information Systems (C2IS) at all levels of command.”⁹⁷ Through MIP, countries work collaboratively to increase interoperability by agreeing on development direction but they do not direct specific system decisions as each member must build the interface in accordance with their own ways and means. In the following figure, the participants and level of integration of MIP can be seen.

⁹⁵ The Europe team comprises more contributions from JMTC and USAREUR simulations personnel; these are the higher headquarters of JMRC. As for participating units, this includes US and multinational formations.

⁹⁶ Joint Multinational Readiness Center, Simulations. *JMRC MC-Sims Brief*. (PowerPoint presentation, JMRC, 2016), Slide 7-8.

⁹⁷ Ibid., slide 8.

Table 5. Who Has MIP Implementation?

Full Member Nations				Associated Member Nations			
Baseline	Implemented and able to deploy MIP Block 2	Implemented and able to test and deploy MIP Block 3.0.	Implemented and able to test or deploy MIP Block 3.1.	Baseline	Implemented and able to deploy MIP Block 2	Implemented and able to test and deploy MIP Block 3.0.	Implemented and able to test or deploy MIP Block 3.1.
Nation				Nation			
CAN 	NO	NO	YES	ACT 	YES	NO	NO
DEU 	YES	NO	YES	AUS 	YES	YES	YES, Q2 of 2014
DNK 	YES	YES	YES (SITAWARE 5.9)	AUT 	NO	YES	YES, Q4 of 2014
ESP 	NO	NO	NO	BEL 	YES	NO	YES
FRA 	YES	NO	NO	CHE 	NO	YES	YES, Q4 of 2014
GBR 	YES	NO	NO	CZE 	NO	NO	YES
ITA 	YES	NO	YES	EST 	NO	NO	NO
NLD 	YES	NO	YES	FIN 	NO	YES	NO
NOR 	YES	YES	YES	GRC 	NO	NO	NO
SWE 	YES	YES	TBD: Sweden plans to move towards and implement MIP BL 3.1 in our C2IS systems within 1-3 years	LTU 	NO	YES	NO
TUR 	NO	YES	YES	NZL 	NO	YES	YES (Planned for Q1 (Feb) 2014)
USA 	YES	YES	YES	POL 	YES	YES	NO
				PRT 	NO	YES	NO
				ROU 	YES	YES	NO
				SVK 	NO	NO. Not implemented, but tested and used only in CE exercises.	NO, but able to test in 2014 and deploy 2015.
				SVN 	YES	NO	NO
				ZAF 	NO	NO	NO

MIP Block 3.0 will not be supported by the MIP community and both MIPBlock 2.0 & 3.0 are being deprecated.

Source: Joint Multinational Readiness Center, Simulations, “JMRC MC-Sims Brief” (PowerPoint presentation, JMRC, 2016), slide 10.

The overall goal through MIP is not a simulations system but rather interoperability of command and control systems. However, the program shows the level of collaboration and is one example of a desire in EUCOM partners to increase the ability to operate in a digital capacity seamlessly. JMRC represents a facility investment and the usage of this resource by our partners on a routine basis for training and increased knowledge enables the conclusion there is not a gap in this area of DOTMLPF. As for personnel, LTC Higgins and the conglomerate of simulations officers throughout the commands within EUCOM in combination with NATO and EU staff members assigned to simulation positions show a commitment along this line as well. More substantial

simulations events are occurring between the U.S. Army and multinational partners, which show where capabilities gaps do exist.

The conversation with LTC Higgins highlighted a few of the simulation training events being conducted between the U.S. Army and multinational partners. The USAREUR simulations team provided another such example in the planning and after action documents of exercise Swift Response 16. This training event revealed connectivity of systems between CONUS and OCONUS as the 82nd Airborne Division participated from Fort Bragg to operations based in Germany and Poland.⁹⁸ Although similar in nature to the concept of this study, the key difference is echelon. During Swift Response 16, mission command and intelligence capabilities were connected into the live environment with CONUS to OCONUS linkage. These capabilities were retained at the Division and Brigade levels during the exercise. A case can be made the simulation of UAS systems for a live audience, as part of the exercise is substantial evidence in support of the primary research question. However, in this example, the tactical level participant was the receiver of simulated capability from a higher echelon and not, as this study is seeking, a user of simulation for training with multinational partners from home station. The division level conducted this type of training, which is similar to training conducted by U.S. Army units through Swift Response 16 as proposed by the primary research question.

⁹⁸ Brad Joy and Bob Cunningham, “Swift Response 16: M&S COA” (Simulations course of action presented at the In-Progress Review of Swift Response 16,”05 Grafenwoeher, Germany, 1 June 2016).

U.S. Army units can conduct home station training at the tactical level that is linked to multinational partners in a realistic operational environment that enables mission readiness. Based on the missions of the Army, standards of training, available technology, and desires of our partners there is a place for tactical level simulations training with multinational organizations. Currently, the ability to do this resides solely in the gaming environment, which does afford tactical echelons a viable training forum with our partners. What is lost in the gaming environment is immersion into physical components much like a CCTT does for the training audience. LVC-IA options are available but no current example of distributing it from CONUS to OCONUS were found; nor was a specific example found of using the constructive environment with a system like CCTT and linking that training audience into a multinational training event. This type of use of available technology generates the solution offered to the primary research question by this study. However, if a system like CCTT were to be linked into the constructive environment at a CONUS site, which was distributed through LVC-IA to a multinational partner conducting virtual or constructive training at an OCONUS site, then a U.S. Army company or platoon could participate in training from their home station.

Summary and Conclusions

LTC Higgins of JMRC noted that the bigger the exercise, the less focus lower or subordinate units would get. While in EUROM, the allies and partners of the U.S. Army are oriented on collaboration and cooperation in preparing for and executing solutions to support simulations, current operations that are taking place in line with these factors are conceived and carried out at higher military echelons. The result at the tactical level is

degraded development, resources, and impacts. This research project identifies key gaps within the DOTMLPF framework in the areas of Training, Materials, and Leadership and Education that present obstacles to accomplishing linked simulations training at the tactical level. These gaps and recommendations to solving the gaps are reviewed in the next chapter.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This final chapter takes the findings described earlier and further expands on the gaps in capability within DOTMLPF. Then recommendations of actions that could be taken to close those gaps, and recommend continued areas for study regarding the proposed concept. Based on the results of the two research approaches the theory is justified in both doctrine and policy, is currently available via gaming, and U.S. Army partners such as NATO and the EU are invested into development of simulation capacity. Therefore, the recommendations presented in this chapter are from the training, leadership and education, and materials portions of the framework, as these areas are where capability gaps exist.

Training is happening and will continue to happen between U.S. Army formations and their multinational partners. Only a small number of these operations were presented in this research for even EUCOM; expanding to a global viewpoint produces exponentially more examples. Multinational training should follow the prescribed methodology from FM 7-0 of crawl-walk-run at the tactical level, and not just the higher echelons. When reviewing Swift Response 16, a planning cycle at the operational level mirrored crawl-walk-run but the methodology did not correlate to tactical level opportunities. The 82nd Airborne Division had numerous planning conferences with all the entities involved over a period of nine months before a tactical element went live in OCONUS. The higher headquarters began planning in September for a June execution while the tactical elements of the exercise from the 82nd arrived only one week prior to

the training. There is no indication that any prior planning or preparation activities by tactical formations occurred while linked or in collaboration with the multinational participants. Using the methodology of crawl-walk-run, some such opportunities should have been designed for all echelons. Simulations training linked from home station is such a mechanism that would allow units to fully invest into the training philosophy.

Even though training doctrine and exercise design already supports this concept at higher military echelons, explicitly tactical level exercises between company formations can be added to the build-up to a major exercise. Leadership and education would also improve through linked simulation training in the areas of unit cohesion and proficiency for both the U.S. and multinational sides due to increased training opportunities. The support for adding these exercises comes from FM 7-0. The mixing of LVC is a core fundamental according to the doctrine, and yet, much like the ARI study feedback showed, leadership's preference for a preponderance of live training is overwhelming. To enhance the education and available resources to leaders this study recommends a greater emphasis on the relationship between the simulation officer that is assigned to all divisions and the tactical level leaders (battalion and company). Through this relationship, a subject matter expert (the FA 57) could smooth the resistance to simulations training and reduce the perceived complexity of designing such training. Additional education opportunities were found during research within the potential threat category.

The idea of the Gray Zone and the elements of the hybrid threat are not necessarily new, but they are different from the traditional training opposing force. These theories also increase the complexity of what exactly to train towards (tactically) as well

as increase the level of resources required for replicating the operational environment. Simulations can function as source providing all the elements required of that environment without as much cost in time and money. As for the tangible training objective, this study proposes a methodology similar to Jakub Grygiel's from "Arming Our Allies: The Case for Offensive Capabilities". His concept is strategic in nature and therefore the recommendation is not to completely adopt the author's thesis. Grygiel suggests a transition from defensive minded operations between the U.S. and partners to an offensive posture. This study recommends that the educational value of linked simulations training is that both forces involved are afforded the time and space to train other capabilities than what the live environment training supports. However, these methods for training require a willingness from leadership to allow for lower echelon training beyond what the current information suggests. The large-scale operations would not have to go away but more emphasis on the lower subordinates would have to increase. The position of this study is these recommendations would be easy to implement and provide immediate dividends to Army organization, especially those assigned to a RAF mission in EUCOM. But there are still material solutions required to bring this concept to full mission capability.

The fundamental material solution would be an increase in multinational LVC-IA capability. The technology exists to perform linked training but the capability is not present in required locations. JMRC should be utilized as a hub to test this concept and as a test bed to afford CONUS to OCONUS linked simulations training between the U.S. Army and multinational partners. The ability for partners to gain experience of this training potential through JMRC could drive a desire to invest and develop the necessary

capability within their own infrastructure. The MIP is an excellent example of the required collaboration necessary for solutions to gain momentum already in action. JMRC has a relationship to MIP and therefore is an organization well postured to act as the foundation for future development of training initiatives between the U.S. Army and multinational partners.

The Synthetic Training Environment (STE) is a potential solution to capability gaps in simulation training discovered during research. The intent of this simulations technology is that the environment would be available to a larger amount of systems. With the STE, the key data from the PEO STRI handbook is in the explanation of the system. The information indicates the STE will not have a hardware component in development; instead, the program utilizes existing and future commercial or government off-the-self hardware.⁹⁹ The STE will consist of point of need delivery capability and acts as the system of record to enable simulations with unified action partners; which is where our multinational partners fit into the equation.¹⁰⁰ From enhancements through the STE, the overall capability with our multinational partners will increase.¹⁰¹ This program will function as a transition away from large infrastructure requirements at home station or CTC locations; instead providing a dispersed “cloud” based delivery method allowing the STE to reach the training audience wherever their location may be around the globe.¹⁰²

⁹⁹ PEO STRI, 67.

¹⁰⁰ Ibid.

¹⁰¹ CAC-T, 3.

¹⁰² Ibid., 14.

This method also increases the ability to deliver linked simulations capacity to our multinational partners. Lastly, the white paper indicates the first objective is for brigade and lower formations to have this ability and then the higher echelons.¹⁰³ Unfortunately, the STE is not an existing capability and mostly remains a conceptual framework for development of simulations. Continued investment in this approach for development is a recommendation by this study.

The evidence found through the research allowed for these recommendations. Additional areas were identified during the process and have potential for future investigation that this study did not have the time or experience to undertake. Recommendations of future research opportunities are covered in the next portion.

Recommendations

A by-product of the framework for this research resulted in connections to several other concepts, which this study recommends as options for future study. The first is the Army Warfighting Challenges from the AOC. Answers to the research questions of this project in other location across the globe would be of value as a future effort. Next, much like the recommendation of using simulations to test and educate leadership against the Gray Zone concept, a similar methodology on the utility of this type of training as a test bed for Multi-Domain Battle would be a valuable research project. The placement of FA 57 simulation officers in the BCT MTOE is another recommendation for investigation, but is outside the scope of this study. Lastly, an actual attempt at conducting linked simulations training from CONUS to OCONUS at the tactical echelon is recommended.

¹⁰³ CAC-T, 2.

Summary and Conclusions

The innovation and willingness to collaborate by the initial leaders of TRADOC in the 1970s gave the U.S. Army material solutions to warfighting, new training methodologies, and AirLand Battle as a means of conducting operations. The spirit of this study was generated from those lessons and a desire to seek innovative approaches to the current strategic orientation of the U.S. Army. As the study showed, the intentions of not only the U.S. leadership, but those of our closest partners and allies, are to maximize collaboration and cooperation in security matters within Europe. Army organizations such as the ABCTs are in a persistent window of time where they will be assigned to a RAF mission and thus working with multinational contingents. Due to the persistent nature of missions the readiness of units is time and resource intensive, which simulations can aid in easing those burdens while also being a well-accepted means of training. Currently, though, the U.S. Army seems to only leverage linked simulations training at the Division echelon or higher which means lower formations are missing an opportunity. The simulations capability is not robust in present form as gaming is the only environment realistically available to units for CONUS to OCONUS tactical training. But systems like the CCTT through LVC-IA show technological solutions that are available today just not in a robust enough capacity with our partners. More can be done to resolve this discrepancy in ways and means of training with multinational formations.

Recommendations of this study were presented through the DOTMLPF framework as a method to generate both acceptance and momentum in U.S. Army organizations. The depth of this study did not seek enduring solutions in all elements of the framework but did find solutions to several. In addition, the U.S. Army does not need

solutions in all areas because in many cases there is an existing capability or capacity that could immediately be leveraged to gain linked simulated training. A greater leadership emphasis and potential a more creative approach would find quick and easy victories in simulations preparation activities. Still, more research into varying simulations and operational concepts could create benefits. Such research may elevate this training concept from plausible to possible, while also having cascading effects to the total force in mission readiness and innovative solutions to the problems the senior officers of the military are posing to the force .

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